

Notice of Allowability

Application No.

10/749,273

Examiner

Johannes P. Mondt

Applicant(s)

LIN, CHUN-CHIEH

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 4/14/05 (Amendment), 6/20/05 (Suppl. Am.).

2. ☒ The allowed claim(s) is/are 1,5-26,31-50 and 54-68.

3. ☒ The drawings filed on 29 December 2003 are accepted by the Examiner.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some* c) ☐ None of the:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____.

3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

(a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.

(b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____

4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material

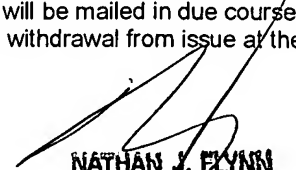
5. ☐ Notice of Informal Patent Application (PTO-152)

6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____

7. ☒ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____


NATHAN J. FLYNN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

Response to Amendment

Amendment filed 4/14/05 forms the basis for this office action. In said Amendment Applicants (a) cancelled claims 2-4, 27-30 and 51-53, substantially amended all of the remaining previously outstanding claims, and added new claims 59-68. A numbering problem previously corrected by administrative staff appears to persist in that number 48 is skipped in the numbering of the claims as submitted in said Amendment. Upon request by examiner Applicant faxed a correction of the claim language correcting said numbering problem. Said numbering problem is corrected below by Examiner's Amendment. **Said Examiner's Amendment first renumbers, then amends with reference to the new numbering.**

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Attorney D. Hofman on June 27, 2005. The Examiner's Amendment is as follows:
In Claim 1: the wording: "a contact layer having a first portion connecting a second portion and a third portion" (line 4) has been replaced by: "a contact layer having a first portion, a second portion and a third portion, said first portion connecting said second portion and said third portion".

First of all Claims 49-69 have been renumbered 48-68. Furthermore, with reference to the renumbered claim set:

In Claim 1: on lines 4-6, the wording "a contact layer having a first portion connecting a second portion and a third portion, wherein the first contact layer portion" has been replaced by: "a contact portion having a first portion, a second portion and a third portion, said first portion connecting said second portion and said third portion, wherein the first portion".

Also in Claim 1: in line 6 the wording "contact layer portions" has been replaced by: "portions".

In Claim 5: line 1, the wording "the third contact layer portion" (line 1) has been replaced by: "the third portion".

In Claim 6: line 1, the wording "third contact layer portion" has been replaced by: "third portion".

In Claim 26, the wording (lines 5-6): "source and drain contacts having a first portion connecting a second portion and a third portion" has been replaced by: "source and drain contacts having a first portion, a second portion and a third portion, said first portion connecting said second portion and said third portion".

In Claim 50: the wording "a contact layer having a first portion connecting a second portion and a third portion" (lines 6-7) has been replaced by: "a contact layer having a first portion, a second portion and a third portion, said first portion connecting said second portion and said third portion".

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In Claim 50: the wording "the first contact layer portion" (line 8) has been replaced by:
"the first portion".

Also in Claim 50: the wording "the second and third contact layer portions" (lines 8-9)
has been replaced by: "the second and third portions".

In Claim 54: the wording "the third contact layer portion" (line 1) has been replaced by:
"the third portion".

In Claim 55: the wording "the third contact layer portion" (line 1) has been replaced by:
"the third portion".

In Claim 56: the wording "a contact layer having a first portion connecting a second and
a third portion" (line 5) has been replaced by: "a contact layer having a first portion, a
second portion and a third portion, said first portion connecting said second portion and
said third portion".

In Claim 56: the wording "the first contact layer portion" (line 6) has been replaced by:
"the first portion".

In Claim 56: the wording "the second and third contact layer portions" (lines 7-8) has
been replaced by: "the second and third portions".

In Claim 57: the wording "the third contact layer portion" (line 2) has been replaced by:
"the third portion".

In Claim 57: the wording "the third contact layer portion" (line 2) has been replaced by:
"the third portion".

END OF EXAMNIER'S AMENDMENT

REASONS FOR ALLOWANCE

2. The following is an examiner's statement of reasons for allowance:

Claims 1, 5-26, 31-50 and 54-68 are allowed because, within the context of the invention as defined by either of independent claims 1, 26, 50 and 56 a contact layer having a first portion, a second portion and a third portion, said first portion connecting said second and third portions, wherein the first portion spans a sidewall of the semiconductor feature and wherein a portion of the semiconductor feature interposes and contacts the second and third portions has not been found in the prior art. Cited to date in specific connexion with said contact layer are Zhang et al (6,040,589) and Furuta et al (5,113,234); however, no contact layer in Zhang et al shows the semiconductor feature interposed and in contact with two contact layer portions connected by a contact layer portion spanning a sidewall of said semiconductor feature, as taught by the invention so as to ensure a minimum contact area even when feature sizes of active areas diminish (see par. [0003]-[0004], [0023]-[0024] and Figures 3 and 4 in the disclosure) : see and juxtapose Figure 5C or any other Figure in Zhang et al showing contact layer 318 or 318/321 or their analogous elements with either Figure 3 or Figure 4 of the Drawings in the Application; while Furuta et al only teaches the portion of the contact layer 8 that is sloped downward to the right (left) of the right-(left-

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)most source/drain region as a possible first portion, but no semiconductor feature portion is *interposed* between the two other, second and third portions of the contact layer (those with horizontal boundaries on opposite sides of said first portion).

Other closely related art is En et al (6,441,433 B1 and 6,518,631 B1) on a multi-thickness silicide SOI device. However, the multi-thickness of the silicide (46,48,54 and 348/354 (Figures 1 and 3E, respectively) is everywhere a single-valued thickness, i.e., there exists no portion of the silicide that (a) spans a sidewall of the semiconductor feature (source/drain region) and (b) connects second and third portions such that a portion of the semiconductor feature not only is on contact with but also is interposed between said second and third portions of the silicide layer.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Johannes P. Mondt whose telephone number is 571-272-1919. The examiner can normally be reached on 8:00 - 18:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J. Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JPM

June 23, 2005